IN THE CLAIMS

1 - 14. (Canceled)

15. (Previously Presented) A method, comprising:

externally injecting a narrow-band incoherent light signal into a light source capable of lasing;

suppressing the lasing modes outside of a bandwidth of the injected incoherent light signal by injecting the narrow-band incoherent light signal; and

locking an output wavelength of the light source capable of lasing within the bandwidth of the injected incoherent light.

16. (Previously Presented) The method of claim 15, further comprising:

generating the incoherent light signal from an optical fiber amplifier.

17. (Previously Presented) The method of claim 15, further comprising:

generating the incoherent light signal from a light emitting diode.

18. (Previously Presented) The method of claim 15, further comprising:

generating the incoherent light signal from a super-luminescent diode.

19. (Previously Presented) The method of claim 15, wherein the light source capable of lasing is a Fabry-Perot laser diode.

20. (Previously Presented) The method of claim 19, further comprising:

operating the Fabry-Perot laser diode as a semiconductor optical amplifier.

21. (Previously Presented) The method of claim 15, wherein the lasing modes outside of the bandwidth of the injected incoherent light incur a side mode suppression ratio of ten decibels or more.

22. (Previously Presented) An apparatus, comprising:

means for externally injecting a narrow-band incoherent light signal into a
light source capable of lasing;

means for suppressing the lasing modes outside of a bandwidth of the injected incoherent light signal by injecting the narrow-band incoherent light signal; and

means for locking an output wavelength of the light source capable of lasing within the bandwidth of the injected incoherent light.

23. (Previously Presented) The apparatus of claim 22, wherein the incoherent light is generated from an optical fiber amplifier.

24. (Previously Presented) The apparatus of claim 22, wherein the incoherent light is generated from a light emitting diode.

25. (Previously Presented) The apparatus of claim 22, wherein the incoherent light is generated from a super-luminescent diode.

26. (Previously Presented) The apparatus of claim 22, wherein the light source capable of lasing is a Fabry-Perot laser diode.

27. (Previously Presented) The apparatus of claim 26, wherein the Fabry-Perot laser diode is operated as a semiconductor optical amplifier.

28. (Previously Presented) An apparatus, comprising:

an incoherent light source that generates a broadband incoherent light;

a coherent light source capable of lasing that can be modulated directly; and

an optical circulator coupled to a coherent light source capable of lasing,

wherein the optical circulator routes a spectral slice of the incoherent light to the coherent light source capable of lasing, the coherent light source capable of lasing emits a wavelength-selective output locked by the spectrally sliced

incoherent light, and the optical circulator separates the output of the coherent light source capable of lasing from the broadband incoherent light.

29. (Previously Presented) The apparatus of claim 28, further comprising:

a polarization controller that is connected between the optical circulator and the coherent light source capable of lasing; and

a polarizer that is connected at the output end of the optical circulator to improve the extinction ratio of the modulated signal.

30. (Previously Presented) The apparatus of claim 29, further comprising:

an optical filter that couples to the incoherent light source to slice the broadband incoherent light to produce a narrow-band incoherent light.

31. (Previously Presented) The apparatus of claim 28, further comprising:

an optical receiver to receive the wavelength selective output of the Fabry-Perot laser diode.

32. (Previously Presented) An apparatus, comprising:

an incoherent light source that generates a broadband incoherent light;

an optical filter coupled to the incoherent light source to spectrally slice the broadband incoherent light to produce a narrow-band incoherent light;

a Fabry-Perot laser diode that can be modulated directly; and

an optical power splitter coupled to the optical filter and the Fabry-Perot laser diode to route the narrow-band incoherent light to the Fabry-Perot laser diode to cause the Fabry-Perot laser diode to emit a wavelength-selective output that is locked by the narrow-band incoherent light, wherein the optical power splitter separates the wavelength-selective output of the Fabry-Perot laser diode from the narrow-band incoherent light.

33. (Previously Presented) The apparatus of claim 32, further comprising:

a polarization controller that is connected between the optical power splitter and the Fabry-Perot laser diode; and

a polarizer that is connected at an output end of the optical power splitter to improve the extinction ratio of the modulated signal.

34. (Previously Presented) The apparatus of claim 32, further comprising:

an optical receiver to receive the wavelength selective output of the Fabry-Perot laser diode.

35. (Previously Presented) A multi-channel wavelength division multiplexing system, comprising:

an incoherent light source that generates a broadband incoherent light;

a demultiplexer that slices spectrally the broadband incoherent light to produce a plurality of narrow-band incoherent light signals; and

a plurality of coherent light sources capable of lasing to couple at the output ends of the demultiplexer, wherein each coherent light source capable of lasing to emit an output signal at a wavelength different from the other coherent light sources and each output signal is locked by an injected spectrally-sliced narrow-band incoherent light signal.

36. (Previously Presented) The multi-channel wavelength division multiplexing system of claim 35, wherein the demultiplexer multiplexes the output signals of the plurality of coherent light sources capable of lasing.

37. (Previously Presented) The multi-channel wavelength division multiplexing system of claim 35, further comprising:

an optical circulator coupled to the incoherent light source, wherein the optical circulator routes the broadband incoherent light to the demultiplexer and separates an output signal of the demultiplexer from the broadband incoherent light.

38. (Previously Presented) The multi-channel wavelength division multiplexing system of claim 35, wherein each coherent light source capable of lasing is a Fabry-Perot laser diodes operating as a semiconductor optical amplifier.

39. (Previously Presented) The multi-channel wavelength division multiplexing system of claim 35, wherein a bandwidth of the incoherent light source is within the free spectral range (FSR) of the demultiplexer.

40. (Previously Presented) The multi-channel wavelength division multiplexing system of claim 35, further comprises:

a plurality of receivers that receive a demultiplexed signal from the demultiplexer.

41. (Previously Presented) The multi-channel wavelength division multiplexing system of claim 35, wherein a first injected narrow-band incoherent light signal into a first coherent light source capable of lasing to suppress the lasing modes outside of the bandwidth of the first injected incoherent light.

42. (Previously Presented) A multi-channel wavelength division multiplexing system, comprising:

an incoherent light source that generates a broadband incoherent light;

a demultiplexer that slices spectrally the broadband incoherent light to produce a plurality of narrow-band incoherent lights;

an optical power splitter coupled to the incoherent light source to route the broadband incoherent light to the demultiplexer and to separate an output of the demultiplexer from the broadband incoherent light; and

a plurality of Fabry-Perot laser diodes to couple to output ends of the demultiplexer, wherein each Fabry-Perot laser diode of the plurality of Fabry-Perot laser diodes emits a wavelength-selective output locked by an injected narrow-band incoherent light, and the emitted wavelength-selective output of a first Fabry-Perot laser diode is at a wavelength different from the emitted wavelength-selective outputs of the other Fabry-Perot laser diodes.

43. (Previously Presented) The multi-channel wavelength division multiplexing system of claim 42, wherein the demultiplexer multiplexes the output signals of the plurality of Fabry-Perot laser diodes.

44. (Previously Presented) The multi-channel wavelength division multiplexing system of claim 42, wherein two or more of the Fabry-Perot laser diodes can be modulated directly.

45. (Previously Presented) An optical transmission system in a passive optical network, comprising:

a remote node that includes a first demultiplexer;

a central office that includes an incoherent light source that generates a broadband incoherent light, a second demultiplexer, and a plurality of receivers that are coupled at the output ends of the second demultiplexer;

a plurality of coherent light sources capable of lasing coupled to output ends of the first demultiplexer, wherein the first demultiplexer receives output signals from the plurality of coherent light sources capable of lasing to generate an upstream signal; and

an optical fiber to connect the central office with the remote node, wherein

the second demultiplexer receives the upstream signal and demultiplexes the upstream signal to the plurality of receivers.

46. (Previously Presented) The optical transmission system of claim 45, further comprising:

an optical power splitter that is connected to the incoherent light source and routes the broadband incoherent light to the optical fiber connecting the central office and the remote node.

47. (Previously Presented) The optical transmission system of claim 46, wherein the optical power splitter delivers the upstream signal through the optical fiber to the second demultiplexer.

48. (Previously Presented) The optical transmission system of claim 45, further comprising:

a plurality of optical network units that are connected to the remote node with a plurality of optical fibers, wherein the first demultiplexer receives the broadband incoherent light transmitted from the central offices, slices

spectrally the broadband incoherent light to produce a plurality of narrow-band incoherent lights, and multiplexes the upstream signal transmitted from the optical network units through the plurality of optical fibers.

49. (Previously Presented) The optical transmission system of claim 45, wherein the plurality of coherent light sources capable of lasing include Fabry-Perot laser diodes that emit wavelength-selective outputs locked by the narrow-band incoherent lights.

50. (Previously Presented) A passive optical network; comprising:

a remote node having a first demultiplexer to slice spectrally a broadband incoherent light to produce a plurality of narrow-band incoherent lights;

a central office including an incoherent light source that generates the broadband incoherent light, a second demultiplexer that receives and demultiplexes an upstream signal, and a plurality of receivers that are connected at the output ends of the second demultiplexer;

a plurality of optical network units that are connected to the remote node

with a plurality of optical fibers, wherein the plurality of optical network units include coherent light sources capable of lasing that connect at the output ends of the first demultiplexer, and each coherent light source capable of lasing emits a wavelength-selective output locked by the narrow-band incoherent lights.

51. (Previously Presented) The passive optical network of claim 50, further comprising:

an optical circulator in the remote node to route the broadband incoherent light delivered from the central office through the optical fiber to the first demultiplexer and the upstream signal from the first demultiplexer to the central office, wherein the plurality of optical network units generate the upstream signal.

52. (Previously Presented) The passive optical network of claim 50, wherein two or more of the coherent light sources capable of lasing can be modulated directly.

53. (Previously Presented) A passive optical network, comprising:

a remote node that includes a first demultiplexer;

a central office that includes a second demultiplexer, a plurality of receivers connected at the output ends of the second demultiplexer, and an incoherent light source that generates a broadband incoherent light having a bandwidth within the free spectral range (FSR) of the first demultiplexer;

a single optical fiber to connect the remote node with the central office;

a plurality of optical network units that include at least one Fabry-Perot laser diode that emits a wavelength-selective output locked by an injected narrow-band incoherent light, and

a plurality of optical fibers to connect the plurality of optical network units at the output ends of the first demultiplexer, wherein the first demultiplexer slices spectrally the broadband incoherent light to produce a plurality of narrow-band incoherent wavelengths of lights, and multiplexes output signals transmitted from the optical network units.

54. (Previously Presented) The passive optical network of claim 53, further comprising:

an optical circulator that connects to the incoherent light source to route the broadband incoherent light to the optical fiber.

55. (Previously Presented) The passive optical network of claim 53, further comprising:

an optical power splitter that connects to the incoherent light source to route the broadband incoherent light to the optical fiber.

56. (Previously Presented) A passive optical network, comprising:

a remote node that includes a first demultiplexer,

a central office that includes an incoherent light source that generates a broadband incoherent light having a bandwidth within the free spectral

range (FSR) of the first demultiplexer, and a second demultiplexer that demultiplexes an upstream signal received from the first demultiplexer to a plurality of receivers coupled to the second demultiplexer, wherein the first demultiplexer slices spectrally the broadband incoherent light to produce a plurality of narrow-band incoherent lights;

a plurality of optical network units that include coherent light sources capable of lasing connected at the output ends of the first demultiplexer, which emit a wavelength-selective output locked by the narrow-band incoherent lights, wherein the first demultiplexer multiplexes the output signals transmitted from the coherent light sources capable of lasing; and

an optical power splitter to route the broadband incoherent light to the first demultiplexer and the upstream signal from the first demultiplexer to the second demultiplexer.